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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/799,560

03/11/2004

Keith L. Berrier

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LAW OFFICES OF MARK L. BERRIER
3811 BEE CAVES ROAD
SUITE 204
AUSTIN, TX 78746

EXAMINER

PATTON, AMANDA K

ART UNIT	PAPER NUMBER
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3709

MAIL DATE	DELIVERY MODE
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06/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/799,560

Applicant(s)

BERRIER, KEITH L.

Examiner

Amanda Patton

Art Unit

3709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Requirement For Information

1. Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.
2. In response to this requirement, please provide a copy of all relevant articles not already cited in this Office action by the following authors referred to in the specification: Duncan and Horn, Kalman (and Bucy), Tikhonov, Philips, Joly et al, El-Jakl et al, Twomey, and Paige and Saunders.
3. This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

Claim Objections

4. Claims 11-19 are objected to because of the following informalities: There are two claims labeled claim 11, and claims 11-19 do not refer to preceding claims. Examiner suggests renumbering the second claim 11 with the number 12, and continued renumbering until claim 18. For examination purposes, claims 11 (second occurrence) –18 have been renumbered 12-19, respectively. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 10 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "reduce" in claims 10 and 20 is a relative term which renders the claim indefinite. The term "reduce" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-20 are rejected under 35 USC 101 because the claimed invention is directed to non-statutory subject matter. The language of the independent claims 1 and 10 raises a question as to whether the claims are directed merely to an abstract idea that are not tied to technological art environment of, machine, process or composition of matter, which would result in a practical application producing a concrete, useful and tangible result to form the basis of statutory subject matter under 35 USC 101. The claims considered to be non-functional descriptive materials that are not statutory even if in combination with a physical medium according to MPEP 2106.02 [R-5] and Interim Guidelines for 35 USC 101. The method of claim 1 and the processor software of claim 10 consist of an algorithms and contains no useful, concrete, and tangible results.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, 4-5, and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by the Joly et al. publication “Time-recursive solution to the inverse problem of electrocardiography: A model-based approach” (Joly et al.). Joly et al. teaches a method of receiving body surface potentials (a first parameter) and performing an inversion of these surface potentials to generate a map of epicardial potentials (a second parameter) (Abstract). Joly et al. also mentions the use of a multi-electrode probe (page 768, line 14-15). In accordance with MPEP 2111.04 [R-3] and as mentioned in *Minton v. Nat’l Ass’n of Securities Dealers, Inc.*, 336 F.3d 1373, 1381, 67 USPQ2d 1614, 1620 (Fed. Cir. 2003)) a “whereby (or wherein) clause in a method claim is not given weight when it simply expresses the intended result of a process step positively recited.” Thus the clause “wherein the inversion is regularized by a Duncan and Horn formulation of a Kalman filter” has not been given patentable weight.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 11-13, 15 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joly et al., and further in view of the Duncan and Horn publication "Linear dynamic recursive estimation from the viewpoint of regression analysis" (Duncan and Horn). Joly et al. teaches all of the limitations of claims 11-13, 15 and 18-19 as set for above, including the receiving of body surface potentials (a first parameter), performing an inversion of these surface potentials to generate epicardial potentials (a second parameter), regularizing the solution using a recursive Kalman filter, and the use of a multi-electrode probe (page 768, line 14-15). Joly et al. does not teach the use of a "Duncan and Horn formulation of a Kalman filter". The examiner wishes to note that the phrase "Duncan and Horn formulation of a Kalman filter" has been interpreted to mean placement of the predictor and corrector equations of a Kalman filter into a single linear system of equations as derived by Duncan and Horn. Duncan and Horn also teaches the use of a recursive dynamic model (3.1), which references multiple steps in time. It is thus necessary that the Duncan and Horn model be based on multiple steps in time. It is also inherent that the number of steps in time is selectable. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the "Duncan and Horn formulation of a Kalman filter" in place of the recursive Kalman filtering used in Joly et al. in order to provide a non-recursive regularization of the ill-posed inverse problem.

13. Claims 3, 6, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joly et al, and Duncan and Horn as applied to the claims 1 and 11 above, and further in view of Beatty et al. (US Patent 6,939,309). Joly et al. and Duncan and Horn teach all of the limitations

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of claims 3, 6, 14, and 16 except the use of a multi-electrode probe with a plurality of regularly spaced electrodes within a chamber of the heart. Beatty et al. teaches the use of a multi-electrode probe with a plurality of regularly spaced electrodes within a chamber of the heart (Figures 3 and 4). It would be obvious to one of ordinary skill in the art at the time the invention was made to combine the multi-electrode probe of Beatty et al. to the combination of Joly et al. and Duncan and Horn in order to receive accurate measurements of electrocardial potentials on the surface of the heart from a distance from the surface of the heart.

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joly et al. as applied to claim 1 above, and further in view of Manwaring et al. (US Patent 6,214,019). Joly et al. does not teach the use of a multi-sensor probe including elements from the group superconductive quantum interference devices, magnetometers, and electrometer amplifier based sensors. Manwaring et al. teaches the use of a magnetometer 34 for the use in a medical device (Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the magnetometer from Manwaring et al. in the method of Joly et al. in order to improve the collection of biological electrical potentials.

15. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joly et al. and Duncan and Horn as applied to claim 11 above, and further in view of Manwaring et al. (US Patent 6,214,019). Joly et al. and Duncan and Horn do not teach the use of a multi-sensor probe including elements from the group superconductive quantum interference devices, magnetometers, and electrometer amplifier based sensors. Manwaring et al. teaches the use of a

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magnetometer 34 for the use in a medical device (Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the magnetometer from Manwaring et al. in the combination of Joly et al. and Duncan and Horn in order to improve the collection of biological electrical potentials.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure are El-Jakl et al. and Oster and Rudy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda Patton whose telephone number is (571) 270-1912. The examiner can normally be reached on Monday - Thursday, 8:30am - 5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jackson can be reached on (571) 272-4697. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AKP
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5/29/2007

GARY JACKSON
SUPERVISORY PATENT EXAMINER

Gary Jackson
5/29/2007